

**Amendments to the Claims**

Please amend the claims as follows:

Claims 1-12 (cancelled).

13. (New) A method for producing an MR contrast agent, the method comprising the steps of:

- obtaining a solution comprising a solvent, a hydrogenatable, unsaturated substrate compound and a catalyst for the hydrogenation of said substrate compound, wherein said substrate compound comprises imaging nuclei;
- hydrogenating said solution with hydrogen gas ( $H_2$ ) enriched in para-hydrogen ( $p\text{-}^1H_2$ ) to form a hydrogenated contrast agent; and
- exposing said hydrogenated contrast agent to an initial magnetic field having an initial orientation followed by a series of magnetic field pulses for enabling spin-order to be transferred from protons in the hydrogenated contrast agent to polarization of a nucleus within the same molecule for enhancing the contrasting effects of the contrast agent adapted for use in an MR application, wherein each pulse has a specific magnetic field strength, orientation and duration, and wherein each pulse has a different orientation to the pulse prior and, optionally, the final pulse has the same orientation as said initial field.

14. (New) The method according to claim 13, wherein said exposing step comprises the steps of:

- placing a dose or part of a dose of said hydrogenated contrast agent in a magnetic field treatment chamber having an initial magnetic field on the order of the earth magnetic field and an initial orientation; and
- subjecting said dose or part of a dose of said hydrogenated contrast agent to a said series of magnetic field pulses, wherein each pulse has a specific magnetic field strength, orientation and duration, and wherein each pulse has a different orientation to the pulse prior and, optionally, the final pulse has the same orientation as said initial field.

15. (New) The method according to claim 13, wherein each of the magnetic field pulses are realized through the steps of:

- rapidly increasing the magnetic field in one orientation;
- maintaining the magnetic field at a constant level and orientation for a predetermined duration; and
- rapidly decreasing the magnetic field.

16. (New) The method according to claim 13, wherein each of the magnetic field pulses of said series of magnetic field pulses essentially follow immediately after each other.

17. (New) The method according to claim 16, wherein the magnetic field is increased from an essentially zero-field to a magnetic field with a field strength in the interval of 0.1-1 mT.

18. (New) The method according to claim 16, wherein the duration of the constant magnetic field is in the interval of 1-100 ms.